Region 1, New England

RISK UPDATES

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RISK UPDATES is a periodic bulletin prepared by EPA Region I New England risk assessors to provide information on new regional guidance. Risk Updates is distributed to contractors supporting Superfund and RCRA, regulators, and interested parties. Risk assessment questions may be directed to the following EPA scientists (area code 617 unless otherwise noted):

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Editor
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RAGS PART D

In January 1998, EPA released "Part D" of the Human Health Risk Assessment Guidance Series for Superfund (RAGS). This marked the fourth guidance in the RAGS series. RAGS Part A contains basic information for how to conduct a human health risk assessment and provides the necessary background for RAGS Part D. RAGS Part B provides guidance on the development of preliminary remediation goals and RAGS Part C outlines the various risk evaluations which should be conducted after the remedial investigation and baseline risk assessments are complete (particularly risks from remedial alternatives). RAGS Part D provides a standard method for planning, reporting, and reviewing human health risk assessments and is expected to improve the overall risk assessment process.

RAGS Part D was developed in response to external criticisms that risk assessments were not transparent or consistent. As such, development of a standardized risk format was identified as one of the Superfund Administrative Reforms. A national workgroup of EPA risk assessors developed the guidance which was reviewed by EPA, State, DOD and DOE staff. RAGS D consists of three basic elements: 1. use of **Standard Tools**, 2. **Continuous Involvement of the EPA Risk Assessor**, and 3. an **Electronic Data Transfer Element to a National Superfund Database**. The **Standard Tools** includes the *Technical Approach for Risk Assessment* which indicates where, in the CERCLA remedial process, the risk assessor's input and evaluations are necessary. It is intended to ensure that risk assessment requirements are clearly defined and that the appropriate planning will occur. The Standard Tools also contain the *Standard Tables* that clearly and consistently document important parameters, data, calculations and conclusions from the risk assessment. The *Standard Tables* will not only provide risk information in a consistent format, but will also clarify the assumptions and increase the reader's ability to understand the chosen approach. Electronic templates for the

Standard Tables are available from EPA in LOTUS® and EXCEL®. For site specific risk assessments, the *Standard Tables*, related Worksheets and supporting information should first be prepared as interim deliverables for EPA risk assessor review, and later included in the Draft and Final Baseline Risk Assessment Reports.

RAGS Part D also emphasizes early and **Continuous Involvement of the EPA Risk Assessor** from scoping through completion and periodic review of the remedial action. EPA risk assessor involvement will improve the reasonableness and consistency of risk assessment assumptions and conclusions. It will also help ensure that conclusions of the risk assessment are appropriately understood and applied to risk management decisions.

The **Electronic Data Transfer Element,** while still in development, will store site-specific risk information contained in the *Standard Tables*, in a National Superfund Database. This component of RAGS D will accomplish reporting requirements, facilitate data consistency review, and make data readily available for interested parties to review. RAGS Part D became effective January 1, 1998 and applies to all Superfund risk assessments (including those performed by Federal Facilities) commencing after this date. RAGS D applies to all stages of the Superfund RI/FS process including the Record of Decision (ROD), Explanation of Significant Differences (ESDs), amended RODs and five-year reviews. The use of RAGS D is encouraged at RCRA Corrective Action and removal sites.

RAGS Part D can be obtained at: www.epa.gov/superfund/programs/risk/ragsd while questions on the guidance can be directed to any Regional risk assessor.

Written by Ann-Marie Burke

COPC Selection Process Update

In a previous issue of the Risk Updates Newsletter (Update #3, 8/95), EPA Region I addressed the selection of chemicals of potential concern (COPCs) for focusing risk estimation. At this time, Region I is updating the process in order to reflect a change in the use of readily available risk based concentrations (RBCs) and clarifying the role background data plays in selecting COPCs.

EPA Region 9 Risk Based Concentrations

EPA Region I is adopting EPA Region 9 RBCs for the COPC selection process, because Region 9 RBCs address the following routes of exposure:

- Tap Water:
  ingestion, and inhalation of volatile organic compounds (VOCs)
- Soil:
  incidental ingestion, inhalation of particulates and VOCs, and dermal absorption
- Ambient Air:
  inhalation of particulates and VOCs.

Region 9 RBCs should be used in lieu of Region 3 RBCs in the COPC selection process according to the guidance presented in the 8/95 Region I Risk Update #3 Newsletter. Exposure routes unique to the Region 9 RBCs are dermal absorption of contaminants, and inhalation of VOCs and particulates from soils. Region 9 RBCs also incorporate the latest EPA dermal risk evaluation procedures and are available from the Region 9 web site (referred to as Preliminary Remediation Goals) at: www.epa.gov/region09/waste/sfund/prg/index.htm.

Background Data and Risk Management

EPA Region I also seeks to clarify that comparisons between site and background levels of metals or organic compounds (i.e., either naturally occurring or anthropogenic) may not be used to eliminate any COPC from the risk evaluation process. The objective of the COPC selection process is to focus the analysis on those chemicals most likely to present a hazard if exposure were to occur. Chemicals present below background concentrations may still significantly contribute to the total site risk and therefore should be retained in order to conduct a complete characterization of site risk. Furthermore, EPA is increasingly interested in evaluations of cumulative risk (i.e., site-related risks and risks from other sources) in seeking how best to manage risk.

Evaluation of the nature and magnitude of background levels of risk is a very important tool for risk management. EPA typically does not require clean-up below background. Background data comparisons for compounds contributing significantly to the

overall risk level is very relevant and could represent a cost-savings by tailoring background sample analyses to just the few compounds in question. The relevance of background levels of contamination should be discussed in the risk characterization, uncertainty section, or remedial response objectives development. An EPA workgroup is currently developing national guidance on background data collection and interpretation.

Written by Cindy Hanna

Clarification on the Exposure Point Concentration for Ground Water Risk Evaluation

As another matter of clarification to a previous Risk Update (Update #2, Aug. '94), EPA Region I wishes to emphasize that the highest temporal average concentration from a single well may be used as the reasonable maximum exposure (RME) point concentration for use in Superfund Risk Assessments to evaluate risk to potential groundwater users. The RME ground water concentration is to be based on the highest of the temporal average concentrations of each contaminant in each well provided that a sufficient number of sampling events have been obtained over a sufficient period of time so as to characterize a temporal average exposure concentration for a given well. It is not possible to specify the minimum number of sampling events needed to characterize a temporal average as each site will be subject to different conditions (ground water velocities, seasonal fluctuations in the water table, etc.). In situations in which an EPA risk assessor in conjunction with an EPA hydrogeologist conclude that insufficient data exists upon which to generate a temporal average concentration, then EPA Region I advocates the maximum groundwater exposure point concentration be utilized for RME risk evaluation purposes.

For questions on this approach, contact any Superfund risk assessor.

Adult Exposure to Lead in Soil: Update

EPA's Technical Review Workgroup (TRW) developed a methodology for evaluating the hazard potential resulting from adult exposures to lead in soil. The TRW methodology results in an estimate of the fetal blood lead concentration among women exposed to lead contaminated soils. The basis of the approach recommended by the TRW stems from the relationship between the soil lead concentration and the maternal blood lead concentration. Fetal blood lead concentrations which are proportional to maternal blood lead concentrations can then be estimated. Fetuses are considered a highly sensitive population with respect to adverse effects of lead during development. The blood lead level of concern for a fetus is 10 ug/dL. EPA's health based goal is to limit the risk of exceeding the level of concern to no more than 5%. The approach is similar to the slope factor approach proposed by Bowers et al, 1994.

The TRW published the methodology in "Recommendations of the Technical Review Workgroup for Lead, an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil", December 1996. This report is available on the Internet at the TRW's homepage: www.epa.gov/superfund/programs/lead/index.htm. The report describes the basic algorithms used in the methodology and default parameter values that can be used when site-specific data are lacking. Consultation with the TRW workgroup (via the web) on the applicability of the adult lead methodology to other populations (such as adolescents) is strongly advised.

References

Bowers, T.S., Beck, B.D., Karam, H.S., 1994. Assessing the relationship between environmental lead concentrations and adult blood lead levels. Risk Analysis 14:183-89.

W*ritten by Margaret McDonough*

Risk Assessment Protocol for Hazardous Waste Combustors

EPA's Office of Solid Waste (OSW) has released a draft guidance entitled: Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Volumes 1, 2, and 3 (EPA530-D-98-001A,B,C July 1998). This supercedes the 1994 OSW draft Guidance for

Performing Screening Level Risk Analyses at Combustion Facilities Burning Hazardous Waste. The guidance develops an understanding of the potential human health risks associated with the emissions from hazardous waste combustors. The guidance includes specific parameters, pathways and algorithms that evaluate both direct and indirect exposure and risk. It reflects other pertinent EPA risk guidances including the Exposure Factors Handbook (1997), Mercury Report to Congress (1997), and Estimating Exposure to Dioxin-Like Compounds (1994).

OSW intends to use risk estimates generated in accordance with the guidance for the permitting of RCRA hazardous waste combustors to ensure they are protective of human health and the environ-ment. (An ecological risk companion to the human health risk protocol is anticipated for release later this year.)

It is recommended that the Human Health Risk Protocol for Hazardous Waste Combustors be used in conjunction with the OSW risk burn guidance on Collection of Emissions Data to Support Site-Specific Risk Assessments at Hazardous Waste Combustion Facilities (EPA 530-D-98-002 August 1998). Since the human health risk protocol was released for external peer review, it may undergo some modification in the future. Readers can access the draft human health risk protocol (www.epa.gov/epaoswer/hazwaste/combust/risk.htm) or obtain a hard copy by calling the RCRA hotline at (800) 424-9346.

Written by Jui-Yu Hsieh

Addressing Environmental Health Threats to Children

In September 1996, EPA released "Environmental Health Threats to Children" (available on the web at www.epa.gov/epadocs/child.htm) detailing health threats faced by children from toxics in the environment. Key findings of the report highlight differences between a child's exposure and resulting health risks vis a vis an adult's. For example, children are known to differ from adults in terms of the amount and types of exposure, physical sensitivity and vulnerability to chemical agents, and the likelihood of lifelong effects. EPA called for a new national agenda to protect children from these risks more comprehensively than before. Shortly afterwards, EPA created a new Office of Children's Health Protection to ensure that infant and children's health protection are consistently and explicitly integrated into all EPA actions.

President Clinton signed an Executive Order on children's health in April of 1997, calling healthy children and strong families fundamental to the future of our nation and emphasizing that protection of the environment is critical to our children's health. Two Washington based subcommittees were established in response to the Administration's call: one was tasked with increasing public access to federal government sponsored research on environmental health and safety risks to children, and the other identified public outreach activities that would protect children's environmental health and safety. Topping the list of children's health concerns are: asthma, unintentional injuries, developmental disorders, and childhood cancers.

In January 1999, President Clinton's budget proposal sought $68 million for fighting asthma alone, just one of the top children's health priorities. Most of the money – $50 million – would be used for competitive state grants to identify and treat asthmatic children who are served by Medicaid. Two million dollars would be used to fund asthma related research and $8.4 million would be used to establish school-based asthma programs that reduce or eliminate allergens and irritants. In addition, the budget proposal seeks to establish an asthma surveillance program, expand support for state and local public health action, promote clinician and patient implementation of national guidelines for reducing environmental risks that worsen asthma, and reduce children's exposure to environmental tobacco smoke.

Despite concerted efforts, current statistics about increasing rates of asthma among young children and unchanging rates of lead poisoning in many urban areas in New England has caused serious concern in our region. EPA-New England has begun our own campaign to reduce environmental health risks to children. To date we have invested nearly $400,000 in grants and other aid to communities and non-governmental organizations to help develop programs that protect children from diseases caused by environmental factors. We are engaged in neighborhood projects

throughout New England (see spotlight below on Manchester, NH) that include relandscaping yards to make them lead-free for children, counseling families about ways to make their homes safer, and educating daycare providers about lead poisoning prevention. We have funded programs in New England to help smokers learn the importance of not smoking around children in their care, and sponsored regional conferences on asthma.

We have built new partnerships with other federal and state agencies to expand our ability to help families find resources --including health insurance--for their children. And we are looking creatively at some of our enforcement tools to help reduce environmental health threats to children. For example, companies choosing to offset a portion of an environmental fine may implement a Supplemental Environmental Project benefit-ting the local community.

Spotlight:
Manchester, NH - A Child Health Champion Community

Manchester, New Hampshire is one of eleven Child Health Champion national pilot communities engaged in an aggressive local campaign to reduce environmental health risks facing its children. With the help of $135,000 in EPA funding from the Office of Children's Health Protection, a group of organizations representing a broad spectrum of the Manchester community--from the health department to a local theater group--was formed to help the city's children have a strong and healthy future.

Manchester is an old industrial city, and many of its houses are in poor condition. The city has the highest rate of childhood lead poisoning in New Hampshire, and the largest percentage of school-age children with asthma. Manchester also has the largest and fastest growing immigrant population in the state which complicates efforts to establish an ongoing dialogue about environmental health among its residents. Nevertheless, both the city's mayor and its government have made a strong commitment to charting a course for Manchester that provides its youngest population with the greatest possible opportunities to prosper.

The city's Child Health Champion project offers young families information about how to create a healthy home, right from the start. For smokers who want to quit, the project offers free smoking cessation classes, so that the children in close contact with adults who smoke will stop suffering from the effects of second hand smoke exposure. The project also provides in-home services to reduce asthma allergens and lead dust. In conjunction with allergen and lead dust removal, the local chapter of the Audubon Society is offering free after school eco-health programs to any child who needs a safe place to go while their homes are being cleaned. The community's theater group is producing a show that helps young families understand what they can do to reduce children's risk from environmental factors. Working together, Manchester's Child Health Champions have become a national model, demonstrating how a community can make a difference for their children.

Written by Alice Kaufman, Office of the Regional Administrator

Mercury Update

Interest in mercury contamination has been growing as has the awareness of the impacts of mercury deposition. Now, all six New England states have fish advisories warning against eat-ing fresh water fish. Most of these warnings target sensitive populations, women of child-bearing age, pregnant women, and children.

Several activities have taken place fairly recently designed to help reduce or eliminate mercury emissions and which reflect the latest understanding of the hazards mercury poses to human health. The following represents a brief summary of these activities.

Efforts to Control Mercury

In December 1997, EPA released a Mercury Study Report to Congress identifying the major sources of mercury, costs for controlling mercury emissions, and the impacts and health effects attributed to mercury exposure. This report helped to pave the way for inclusion of mercury as one of the twelve persistent, bioaccumulative, and toxic (PBT) pollutants that EPA is targeting for risk reduction (see related article in this issue of Risk Updates). A national action plan for controlling mercury emissions has already been developed as part of the PBT Strategy. In addition to the emission reductions from sources such as municipal and medical waste incinerators, the plan also supports development of tools to link air emissions with water quality impacts.

Closer to home, the New England states and the Eastern Canadian Provinces have been working together and in Feb. of 1998 released "Mercury Report for the Northeast States and Eastern Canadian Provinces." This led to a joint resolution between the New England Governors and the Eastern Canadian Premiers in which a Regional Mercury Action Plan was adopted. The Regional Action Plan identified 40 specific actions that the states and provinces will take to meet the goal of "virtual elimination of anthropogenic sources of mercury."

EPA is also encouraging voluntary efforts to reduce mercury emissions. As an example, EPA has developed a Memorandum of Understanding with the American Hospital Association (AHA) calling for the virtual elimination of mercury in hospital waste streams. EPA New England is working with local hospitals and State Hospital Associations to reduce mercury emissions from this sector.

Methyl Mercury Reference Dose

The toxic effects of mercury poisoning were well known at the turn of the century, the term "mad as a hatter" was coined to describe the effects from mercury poisoning. Epidemics of methyl mercury poisoning in Japan and Iraq resulted from high-dose exposures to methyl mercury. In these epidemics, both adults and developing fetuses were adversely impacted by exposure to methyl mercury. The epidemics demonstrated that neurotoxicity is the health effect of greatest concern and that the developing fetus was the most sensitive receptor.

Data from the Iraqi methyl mercury epidemic was used by EPA in the revision of the oral reference dose for methyl mercury. Formerly, EPA had based the oral reference dose for methyl mercury on neurological effects observed in adults. Now, using data from the Iraqi study on the neurological effects noted in the fetus, EPA established the oral reference dose at 0.1 ug/kg/day. The reference dose for methyl mercury was also significant in that it is one of the few compounds for which the benchmark dose (BMD) methodology has been used to establish the reference dose. [Information on the benchmark dose approach can be obtained in The Use of Benchmark Dose Approach in Health Risk Assessment published by EPA's Office of Research and Development EPA/630/R-94/007 Feb. 1995 or on the web at www.epa.gov/nceawww1/bmds.htm].

Two additional epidemiological studies from the Seychelles and the Faeroe Islands, are investigating developmental and neurological toxicity resulting from fetal exposure to methyl mercury at exposure levels that are common to fish eating populations. While EPA decided not to incorporate the findings from these epidemiological studies in the RfD for methyl mercury (since much of the data was unpublished or had not been subjected to rigorous peer review at the time), efforts are now underway to re-evaluate the health effects of human exposure to methyl mercury. In Nov. 1998 the Office of Science and Technology Policy of *The White House* organized a conference to evaluate these recent epidemiological studies. They concluded that both studies from the Seychelles Islands and from the Faeroe Islands were scientifically conducted and well designed. Additionally, the National Academy of Sciences (NAS) will soon begin a comprehensive mercury study and prepare recommendations on an appropriate reference dose within the next 18 months.

EPA plans to await the NAS report prior to re-evaluating the current RfD for methyl mercury. In the meantime, EPA's Office of Research and Development will issue interim guidance in order to provide stability and consistency to programs evaluating risks from methyl mercury.

Note: This article was based in part on a paper presented by Glenn Rice of EPA's National Center for Environmental Assessment. If you would like a copy of "Derivation of US EPA's Methyl Mercury RfD," please contact Jeri Weiss.

Written by Jeri Weiss

EPA's Strategy for Reducing Priority Persistent, Bioaccumulative and Toxic Pollutants

In May 1998, EPA released a multimedia strategy to reduce persistent, bioaccumulative, and toxic (PBT) pollutants in the environment. The goal of the strategy is to identify and reduce risks to human health and the environment from existing and future priority PBT pollutants using all tools available to the EPA

(voluntary, regulatory, research, etc.) Persistent, bioaccumulative and toxic pollutants share the character-istic of being highly toxic, long-lasting substances that can build up in the food chain to levels that are harmful to human and ecosystem health. They present an additional challenge to EPA in that they readily transfer between the air, water, and land, they can travel great distances, and linger for generations in people and the environment.

EPA has identified an initial list of 12 PBTs (aldrin/dieldrin, benzo(a)pyrene, chlordane, DDT, hexachlorobenzene, alkyl-lead, mercury and compounds, mirex, octachlorostyrene, PCBs, dioxins and furans, and toxaphene) and will be screening and selecting additional PBT pollutants in the future. EPA's strategy will include the development and implementation of action plans for each PBT. To date, EPA has developed an action plan for mercury. Additional information on EPA's PBT strategy can be found on the web at www.epa.gov/opptintr/pbt.

Summarized from EPA's Web page by Ronnie Levin

Cumulative Exposure Project: Air Toxics

The Cumulative Exposure Project (CEP), initiated in 1994 by EPA's Office of Policy, seeks to evaluate the combined exposures to multiple pollutants through three different pathways- air, food, and drinking water. To date, EPA has focused Agency efforts on air toxics and the potential they present for exposure via inhalation.

In order to develop estimates of concentrations of toxic air pollutants across the United States, EPA has developed a new air quality modeling tool, known as the Assessment System for Population Exposure Nationwide (ASPEN). ASPEN is based on standard EPA air quality modeling methods, and significantly expands the scope of such models by including the capability to model a large number of pollutants across the entire continental United States.

EPA is using the ASPEN model to better characterize air toxics from a national perspective and to help set priorities to reduce emissions of air toxics that may be impacting public health. EPA also intends to use the ASPEN model to track ambient air toxic concentration trends over time and to measure progress toward meeting risk reduction goals.

Assumptions and Limitations of the ASPEN Model

The ASPEN model is a dispersion model which estimates ambient concentrations of air pollutants in two basic steps: first, pollutant emissions are estimated; and second, a computer model simulates the impacts of winds and other atmospheric processes on the pollutants once emitted. Like any computerized dispersion model, ASPEN relies on a number of assumptions and approximations in estimating air toxics concentrations rather than on actual measurements of concentration. The precision of the model is limited by uncertainties in the quantities of pollutants emitted, locations at which pollutants are emitted, and the model's mathematical representations of what happens to pollutants after they are emitted. It should be noted that the model estimates ambient concentrations of air toxics and not an individual's exposure to those pollutants.

1990 Model Characterization Results

As part of the Cumulative Exposure Project, EPA estimated concentrations of 148 air toxics across the continental United States in 1990. Comparison of the 1990 modeled concentrations to the available 1990 air toxics monitoring data showed that the study's modeled concentrations are generally of the correct magnitude, and have a tendency to underestimate 1990 concentrations.

Analysis of the 1990 modeling results, published in the *Environmental Health Perspectives* (May 1998), found that the 1990 modeled concentrations of several air toxics were high throughout the United States in comparison to previously-defined health benchmarks. Thirteen toxic air pollutants had modeled concentrations that exceeded bench-mark values for more than half of the country; for eight of these air toxics, this result was attributable to the impact of 1990 man-made emissions, while for the other five air toxics, this result was attributable to background

concentrations. EPA believes that this initial characterization reinforces the importance of continuing to reduce air toxics.

It is important to note that these modeling results are based on 1990 emissions information, and therefore should not be interpreted as representative of current conditions. Since 1990, EPA, states and local govern-ments have developed standards to reduce air toxics.

Future Applications of the ASPEN Model

EPA's Office of Air and Radiation is working with state and local agencies to update and improve its information on air toxics emissions, and plans to have a final 1996 National Toxics Inventory (NTI) completed by October 1999. In conducting national air toxics assessments, as part of its Air Toxics Program, EPA will use the ASPEN model with the updated NTI to estimate 1996 air toxics concentrations across the continental U.S. Through the remainder of the year, EPA will incorporate the NTI data into the ASPEN model and analyze modeled results. The modeling effort and subsequent follow-up work on public health implications in this area will help prioritize the Agency's efforts to reduce emissions of air toxics that may be impacting public health.

More information about the Cumulative Exposure Project can be found at:

www.epa.gov/cumulativeexposure

Summarized by Susan Lancey, Office of Ecosystem Protection from EPA's Introduction to Estimated 1990 Air Toxics Concentrations from EPA's Cumulative Exposure Project.

Neurotoxicity Risk Assessment Guideline Available

EPA's neurotoxicity risk assessment guideline, published in May 1998, establishes principles and procedures to guide EPA scientists in all program offices in evaluating environmental contaminants that may pose a hazard to the nervous system. The neurotoxicity risk assessment guideline supple-ments the library of guidelines previously available on carcinogenicity, mutagenicity, chemical mixtures, developmental toxicants, exposure assessment, reproductive toxicity and ecological risk assessment. The neurotoxicity guideline addresses the special vulnerability of the nervous system, particularly that of infants and children, to environmentally relevant chemicals, and provides guidance for the interpretation of data from developmental and reproductive studies involving the assessment of nervous system structure and function. While intended to increase consistency in these evaluations, the guideline emphasizes that risk assessments will continue to be done on a case-by-case basis. The neurotoxicity risk assessment guideline can be obtained on the web at: www.epa.gov/ncea/nurotox.htm.

Information obtained from EPA's Web Site.

Endocrine Disruptors

Chemicals which interfere with endocrine system functioning (endocrine disruptors) have concerned the EPA for some time. A variety of human health and ecological effects have been attributed to endocrine disruptors such as behavioral changes, adverse reproductive, develop-mental, and carcinogenic effects. A difficulty remains in that we do not currently know which chemicals interfere with endocrine system function, the extent to which problems exist, or how widespread these compounds may be in the environment.

In 1996, the passage of the Food Quality Protection Act (FQPA) and the Safe Drinking Water Act (SDWA) mandated EPA develop a screening and testing strategy for endocrine disruptors by 1998 and implement the strategy by August 1999. The legislation cites the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA) as the two statutes under which EPA will implement an endocrine screening and testing strategy and also provides supplementary authority to require industry conduct the necessary testing.

Thus in October 1996, EPA commissioned a committee to address the difficult technical and policy issues associated with endocrine disruptor screening and testing known as the Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC). The EDSTAC has proposed a conceptual framework upon which a proposed screening system is based.

The EDSTAC Conceptual Framework places activities in an ordered sequence. The elements of this sequence include: a) priority setting, which includes the sorting and prioritization of chemical substances and mixtures for evaluation in screening and/or testing batteries; b) screening to detect chemical substances and mixtures capable of acting on endocrine systems; and c) testing to confirm, characterize, and quantify the nature of the endocrine disrupting properties of the chemical substances and mixtures identified by prior information and/or screening. EDSTAC also recommended a communication and outreach strategy be developed to inform the public of results of the screening and testing program.

Information obtained from EPA's endocrine disruptor web site: www.epa.gov/opptintr/opptendo/index.htm.

Tox Tidbits

While it is always recommended to check EPA's web version of IRIS (Integrated Risk Information System) at www.epa.gov/iris for the most up-to-date information regarding Agency verified chemical toxicity, *Tox Tidbits* is an attempt to bring recent or often overlooked changes to light. A comprehen-sive summary of recent additions and changes to the IRIS database can readily be accessed by selecting the "What's New" icon on the web page. The following represents examples of recent changes or often overlooked changes in cancer slope factors or unit risk values and reference doses or reference concentra-tions.

Slope Factors

Beryllium. As of March 1998, EPA withdrew the Agency oral slope factor for beryllium. Upon review of the original data, EPA decided that there was not a statistically significant increase in tumors in the treated group relative to controls. EPA withdrew the oral slope factor while leaving the inhalation unit risk in the IRIS database. EPA Region I therefore at this time, only requires quantitation of the carcinogenic potential posed by exposure to beryllium via the inhalation pathway - not the oral pathway. Evaluation of non-carcinogenic health threats posed by beryllium should not be overlooked via the oral and inhalation exposure pathways.

Reference Doses/ Concentrations

Napthalene: As of Sept. 1998, EPA added a verified oral reference dose for napthalene corresponding to 2×10^{-2} mg/kg/day and an inhalation unit risk of 3×10^{-3} mg/m^3. For non-carcinogenic PAHs lacking a current EPA reference dose or concentration, it is EPA Region I policy to adopt the reference dose or concentration of a structurally similar PAH for hazard evaluation purposes.

Chromium VI: As of Sept. 1998, EPA updated the oral reference dose (now 3×10^{-3} mg/kg/day) and added two new inhalation unit risk values corresponding to 8×10^{-6} mg/m^3 for chromium^{+6} acid mists and dissolved aerosols and a second inhalation unit risk of 1×10^{-4} mg/m^3 for exposure to chromium^{+6} particulates.

Manganese: As indicated in the Risk Update #4 (Nov. 1996) the oral reference dose for manganese corresponding to 1.4×10^{-1} mg/kg/day represents an allowable level for the **TOTAL** oral intake. EPA Region I advocates that an adjustment for the dietary contribution be subtracted from this allowable intake as discussed in the IRIS file. The resulting non-dietary reference dose of 7×10^{-2} mg/kg/day should be used for Superfund risk evaluations involving soil exposure. However, for exposures to drinking water, as stated in the IRIS file, a modification factor of 3 should be applied to the non-dietary reference dose resulting in an effective drinking water reference dose of 2.4×10^{-2} mg/kg/day.

Compounds Lacking an IRIS Value

It is EPA Region I Superfund policy to contact the Superfund Technical Support Center when agency verified toxicity values are lacking in the IRIS database. The Tech Support Center has access to non-verified toxicity criteria available from the Health Effects Assessment Summary Tables (HEAST), other EPA program offices, and chemical specific reviews performed on request. While there is talk brewing of placing HEAST values on the Internet, at present they can only

be obtained via the Superfund Tech Support Center. Those external to EPA may contact the Tech Support Center directly at (513) 569-7300 for Superfund Site related inquiries. Other inquiries (not specific to a Superfund Site) should be directed to one of the Regional Risk Assessors listed on the cover of the newsletter.

Several provisional (non-EPA verified) dose-response values that have been released by the Tech Support Center but which the Region I Office does not endorse for use in quantitative risk assessments include provisional oral RfDs for copper and iron. Reasons for not using provisional oral reference doses for copper and iron stem from the fact that they were based on concentrations needed to protect against a deficiency of the compound, rather than on quantitative estimates related to the hazard posed by overexposure to the compound.

Information compiled by Sarah Levinson

EPA Web Sites of Interest

EPA is increasing the amount of information available on the Internet daily. To assist you in locating many useful risk related information distributed by EPA, the following list of web sites was compiled. It is not a complete listing of the available resources, merely a helpful beginning.

1. EPA's Superfund Risk page: www.epa.gov/superfund/programs/risk. This site contains all of the Human Health Risk Assessment Guidelines for Human Health (RAGS Parts A, B, C, and D - the new standardized reporting format) and the Superfund Ecological Risk Guidance. In addition, EPA's Soil Screening Levels, and Guidance on the Use of Probabilistic Risk Evaluation and Monte Carlo Analysis can be found as well as links to numerous other related sites.

2. Region 9 Guidance for Preliminary Remediation Goals (used for COPC selection by Region I): www.epa.gov/region09/waste/sfund/prg/index.htm.

3 EPA Region I Risk Updates: www.epa.gov/region01/remed/riskupdates.html.

4. Integrated Risk Information System (IRIS) - Database of current EPA verified toxicity information: www.epa.gov/iris.

5. EPA lead models (Integrated Exposure Uptake Biokinetic Model or IEUBK for young children, and Recommendations of the Technical Review Workgroup for use of a slope factor approach for evaluating adult exposures to lead):

www.epa.gov/superfund/programs/lead.

6. A multitude of EPA human health and ecological health related publications such as the Exposure Factors Handbook www.epa.gov/ncea/exposfac.htm

7. EPA risk assessment guidelines, benchmark dose methodology, chemical specific information, and links to risk related sites can be found on EPA's National Center for Exposure Assessment homepage: www.epa.gov/ncea.

8. Indoor air screening and risk calculations, vapor intrusion into buildings (Johnson and Ettinger Model): www.epa.gov/superfund/programs/risk/airmodel/johnson_ettinger.htm.

9. Ecotoxicity thresholds for screening: www.epa.gov/superfund/resources/ecotox.

10. Wildlife exposure factors handbook: www.epa.gov/nceawww1/wefh.htm.

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